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National Weather Service - Elko
The Great Basin Spotter Newsletter

Inside this issue:

Winnemucca, NV by Doug Cain, Outreach Focal Point

The Humboldt County Courthouse in Winnemucca, NV was constructed in 1919. This courthouse was built in place of the original which was destroyed by a fire in 1872.

As a new feature in the Great Basin Spotter, we plan on focusing on a different town or city in Northeast Nevada in each issue. Each article will discuss the climate, weather, and local character that makes the area unique. We will begin this series with Winnemucca. In the 1850s, the trading post on the Humboldt Trail along the banks of the river was known as French Ford. In the early 1860s, French Ford was renamed Winnemucca for a local Paiute chief.

Winnemucca sits on the western edge of WFO Elko's County Warning Area, and is the center of commerce, government, and population for Humboldt County. At approximately 4300 feet, Winnemucca is located in the Humboldt River Valley between Winnemucca Mountain and Sonoma Peak (9395 ft). (CONTINUED ON PAGE 3)

Words From the Meteorologist in Charge by Kevin Baker

Meteorologist in Charge, Kevin Baker

In mid-December, I attended a supervisors conference during an unusually rainy and cold week in Tucson, AZ. I gave a presentation to the group of NWS (National Weather Service) Western Region supervisors about the outreach activities of our office over the past several months. Our office has been very proactive in outreach by getting the word out about NWS services. We have included the office web address and NWS logo on our pamphlets that are given to students and teachers. We ordered pencils with our logo and web address, and have distributed these items to many customers. The idea is to increase awareness about warning and forecast services provided by the NWS. Several individuals in our office have expressed interest in providing talks to civic groups, students, and teachers. If you, or someone else you know, have an interest in learning more about NWS services, contact our Warning Coordination Meteorologist, Paul Eyssautier, and set up an appointment. Our phone number is 775-778-6716. (CONTINUED ON PAGE 3)

FAST WEATHER FACTS

Flood Watch: Conditions are favorable for general flooding on established waterways in the next 12 to 36 hours.

Flood Warning: Flooding is imminent or occurring on established waterways within 12 hours of the start of the warning.

Flood Advisory: Minor flooding usually associated with snowmelt is expected to occur or is occurring. This flooding is usually confined to areas immediately adjacent to rivers or larger streams and does not constitute a threat to life and/or property.

2001 Climate Summary for Northern Nevada by Cliff Collins, Lead Forecaster

The second year of a drought continued into 2001. The weather pattern did turn wet around Thanksgiving, but it was not enough to make up for the dry conditions that prevailed most of the year. Ely recorded the 6th warmest year on record and the 14th driest. Winnemucca recorded the 17th warmest year on record and the 7th driest. Elko also had the 17th warmest year on record. However, Elko faired better with precipitation ending the year only 1.19 inches below the normal amount of 9.93 inches.

The dry pattern ended abruptly near Thanksgiving when a series of pacific storm systems began to move through the area. This gave Elko the 12th wettest November-December on record with 3.23 inches of precipitation. The 30.3 inches of snow that was measured made November-December the 5th snowiest on record in Elko. In Ely and Winnemucca, the last 2 months of the year ended with near normal precipitation.

Watch Out For Avalanches! by Paul Eyssautier, WCM

Avalanches are a sudden, sometimes hidden danger that can kill. This year, northeast Nevada has received a significant amount of snowfall. Depending on the weather conditions this spring, avalanches could be a serious problem for outdoor enthusiasts. The following are a few items to consider if venturing into the mountainous regions of Nevada.

Signs such as this are common in mountainous regions. This photo was taken in the Ruby Mountains in northern Nevada.

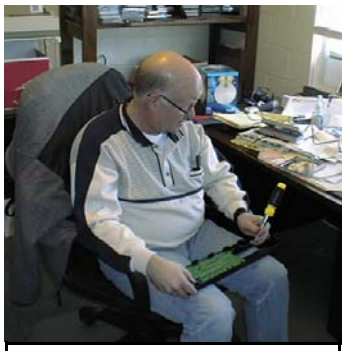
Avalanches can occur on any slope given the right conditions, particularly from December to April, when most avalanches will "run" (slide down a slope). The highest number of fatalities occurs in January, February and March when snowfall amounts are highest in most mountain areas. In the United States, 514 avalanche fatalities have been reported in 15 states from 1950 to 1997. According to the Colorado Avalanche Information Center, 15 people have been killed in avalanches this season through February 7, 2002. Western states account for the majority of fatalities, as with the following: 5 snowmobilers in Montana, 3 skiers in Colorado, and 1 skier in Utah this season. However, in Nevada there have only been 2 deaths reported since 1985.

While expertise is not a guarantee that you won't be caught in an avalanche, it does provide knowledge about how to avoid avalanche areas, what types of weather and terrain signs to watch for, and what to do if you are caught in an avalanche. All that is necessary for an avalanche to occur is a mass of snow and a slope for it to slide down. One type of avalanche is called a slab avalanche in which layers of a snowpack fail and slide down a slope. Hard slab avalanches involve large blocks of snow and debris. With soft slab avalanches, the snow breaks up in smaller blocks as it falls. Slab avalanches are the most common and most deadly. *(CONTINUED ON PAGE 7)*

Flash Floods by Larry Whitworth, Hydrology Focal Point

Northern and central Nevada are prone to flash flooding which is almost always associated with spring and summer rainfall events. By definition, flash flooding refers to flooding caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Areas with mountainous terrain, such as northern and central Nevada, can speed up this process by helping funnel water into a concentrated area in a short amount of time. Factors that need to be considered when evaluating a flash flood situation are soil moisture, storm movement, and rainfall intensity. If the soil is already saturated, it will not be able to absorb any additional water. This is illustrated by a stationary storm remaining over one location for a period of time. If rainfall intensity is also large, the problem becomes even worse by increasing the amount of water on an area. *(CONTINUED ON PAGE 5)*

Winnemucca, NV (Continued from Page 1)



Torrey Sheen, President of Sheen Broadcasting Co.- KWNA Radio. KWNA broadcasts weather information provided by WFO Elko.

French Ford Middle School in Winnemucca.

Winnemucca receives 65% of its annual precipitation between December and May, and has a climate characterized by warm days and cool nights. Daily temperature variations of 50 degrees are not uncommon. Normal high temperatures for Winnemucca range from 42.1 degrees in January, to 63.0 degrees in April, increase to 93.0 degrees in July, and drop to 68.1 degrees in October. The record high temperature for Winnemucca is 108 degrees set in August 1983, with the record low being -37 in December 1990. Average yearly precipitation for Winnemucca is 8.23 inches, with no month averaging more than one inch of precipitation. The record monthly precipitation for Winnemucca is 3.66 inches in December 1983.

NWS Elko Staff will be giving weather presentations at schools throughout Winnemucca and Humboldt County this spring. Planning is underway for presentations in the near future at Sonoma Heights Elementary, the Grammar School, and French Ford Middle School.

Outreach Activities in the New Year by Doug Cain, Outreach Focal Point

Lead Forecaster Linnae Neyman shows a group of Cubs Scouts how to track a weather balloon.

January was a busy start to the outreach year. Linnae Neyman gave an office tour to 25 Cub Scouts who were earning a badge on communication. Linnae showed the scouts how weather information was relayed from the forecast office to the media and public. Linnae also gave an impromptu tour to a group of Elko Fireman who responded to a problem of smoke in our office after a small electrical fire.

Elko Firefighters took an office tour after clearing smoke from the NWS Elko office.

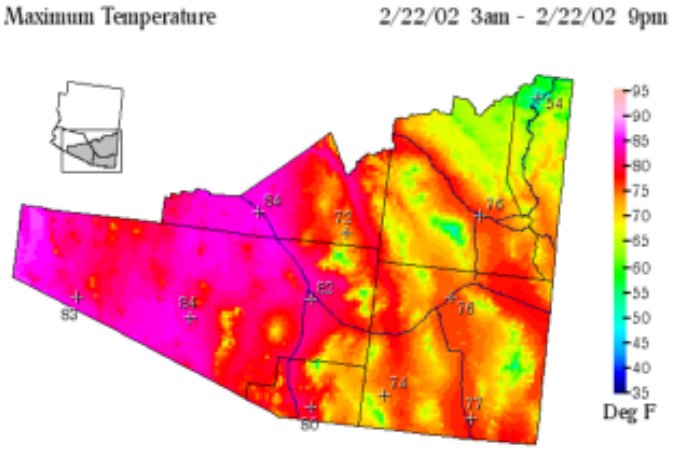
Students from Sage Elementary participated in a Geography-Climatology–weather presentation. These 4th and 5th grade students had been studying geography and climatology and its effects on weather. To cap off their studies, NWS Elko prepared a special power point presentation that tied all these subjects together and discussed how these features affect the development of weather phenomena such as hurricanes and tornadoes. Other presentations included a discussion of rotors and clear air turbulence with the Civil Aviation Patrol by Roger Smith.

Words From the MIC (Continued from Page 1)

There have been a number of changes to our Web Page. This site is going through a transition to a format that will lead to new and better products. The new Page will be compliant with legislation for our customers with disabilities, and sets the stage for new gridded digital forecast products. By late in the year 2003, we expect to be producing many gridded forecast fields which should be viewable on our Web Page or other link. Feel free to e-mail suggestions for Web Page improvement to our Webmasters, Brian Fehrn and Brian Olsen, at w-lkn.webmaster@noaa.gov.

Kevin B. Baker
Meteorologist in Charge, Elko NV

IFPS: the future of weather forecasting by Brian Fehrn, IFPS Focal Point



An example of a high temperature plot currently being produced by the Weather Service Office in Tucson, AZ.

The National Weather Service is working with the Interactive Forecast Preparation System (IFPS) to develop new graphical forecasts. These forecasts created by IFPS will be in addition to the forecasts that are already issued to give the public more freedom in viewing the latest weather information. The potential for the users of these new graphical forecasts is great. Once the forecast is expressed as a set of weather elements on a graph, everyone can view this information in virtually unlimited ways. For example, people traveling by car are most interested in weather parameters that affect driving conditions such as precipitation, wind, and visibility. Other people enjoying the outdoors would be interested in other weather parameters including temperatures and amount of cloud cover. With this new method of forecasting, the National Weather Service can provide forecast data in a manner that not only gives users the information they want or need, but also avoids cluttering forecasts with irrelevant information that might be confusing. We hope to have some experimental forecasts on our website by June. Stay tuned! (For more website information, See *"Changes to Elko Web Page"* on page 6.)

Cooperative Observer Award by Randy Settje, Hydrometeorological Tech

Rosie Albisu, along with her husband John, began taking daily temperature and precipitation readings at McDermitt in January of 1986. They record the data on a weather form and mail it, along with a tape from their automated rain gage, to the Elko office each month. The form and tape are then resent to the National Climatic Data Center in Asheville, North Carolina, where they are archived. In addition, they send their daily weather readings to the Elko office using a ROSA phone. This data is included in a daily temperature and precipitation bulletin that is issued each morning by National Weather Service.

Randy Settje from National Weather Service in Elko, presenting Rosie Albisu with a 15 year Award as a Cooperative Observer at McDermitt.

McDermitt has a long weather history. Weather data collection first began in January of 1892. The original site was on the Fort McDermitt Indian Reservation, and one of the school teachers was usually the Cooperative Observer. The earliest Cooperative Observer we have on record is Mr. Scott Sterling who resigned in 1913. He was replaced by Mr. Frank Bullock. In 1926, the station was discontinued because no one was willing to take weather observations. The station was reopened on August 20, 1945 at the Indian Reservation and school teacher Clyde E. Barnette was the observer. At that time, a recording rain gage was added. In April of 1950, the observing site was moved to the Post Office in McDermitt, and the observer was Mr. Claude Reeves. The equipment was moved to its present location on January 28, 1986.

Severe Weather Spotters and SKYWARN by Paul Eyssautier, WCM

SKYWARN is a concept developed in the early 1970s that was intended to promote a cooperative effort between the National Weather Service and communities. The emphasis of the effort is often focused on the storm spotter, an individual who takes a position near their community and reports wind gusts, hail size, rainfall, and cloud formations that could signal a developing tornado.

The organization of spotters and the distribution of warning information lies with the National Weather Service and emergency management agencies within the community. These agencies could be a police or fire department, or often is an emergency management/service group. This varies across the country, however, with local National Weather Service offices taking the lead in some locations, while emergency management takes the lead in other areas.

SKYWARN is not a club or organization. In some areas where emergency management programs do not perform the function, people have organized SKYWARN groups which work independently of a parent government agency. They feed valuable information directly to the National Weather Service. While this provides the radar meteorologist with much needed input, the circuit is not complete if the information does not reach those who can activate sirens or local broadcast systems.

SKYWARN spotters are not "Storm Chasers." While their functions and methods are similar, the spotter stays close to home and usually has ties to a local agency. Storm chasers often cover hundreds of miles a day. Some are meteorologists doing specific research, or are gathering basic information (like video) for training and comparison to radar data. Others chase storms to provide live information for the media, and others simply do it for the thrill. Storm spotting and storm chasing are dangerous and should not be done without proper training, experience and equipment.

(The above article was taken from the National SKYWARN web page, located at http://www.skywarn.org)

The National Weather Service conducts spotter training classes across the United States. Last year, the NWS Forecast Office in Elko, Nevada provided Weather Safety and Spotter Training Workshops to several communities in northeast and east central Nevada. We plan to present more workshops this spring and early summer. If you are interested in having us present a workshop in your community, or for your club or association, please contact Paul Eyssautier at 775-778-6716, or e-mail at paul.eyssautier@noaa.gov.

Flash Floods (Continued from Page 2)

Seasonal snowpack is a particularly important factor in the mountainous regions of Nevada. Warm rain on snowpack can cause significant flash flooding by helping any snow to melt. Excessively warm temperatures preceding or occurring along with rain can increase the risk of a flash flood situation by making the snow melt even more quickly. The smooth surface of the snow compared to soil will also allow water to travel more easily down a slope.

At the close of a winter with normal to above-normal snowfall and the onset of spring precipitation and melting snow, flash flood potential is at its peak in northern and central Nevada. To alert the public, the National Weather Service issues flash flood statements, watches and warnings, as well as urban and small stream flood advisories. To help identify the threat of a flash flood, the National Weather Service utilizes an automated gauge network consisting of satellite data-collecting platforms that communicate with ground equipment located in remote locations along with stream gauge sites. Doppler radar rainfall estimates can also be helpful in analyzing a potential flooding situation. Other agencies, such as the California-Nevada River Forecast Center in Sacramento, also monitor flood potential for areas in Nevada and provide support. Stay tuned to your NOAA weather radio and our website, www.wrh.noaa.gov/elko, to get the latest information when potential flooding situations arise.

Modified Arctic Air in the Great Basin By Bob Hoenisch, Intern

The northern Great Basin has had an interesting winter season so far with frequent snowfall and seasonably cold temperatures. In late January, an Arctic air mass from northwestern Canada slid down the Rocky Mountain chain and grazed the northeastern portion of Nevada. Ahead of this cold air mass, a winter storm brought snowfall amounts ranging from 1 inch in Winnemucca to 14 inches at Great Basin National Park. As the Arctic air settled in, overnight temperatures plummeted to well below zero across most of the region and broke records in a few locations.

Wild Horse in northern Nevada has received over 50 inches of snowfall so far this season.

Local topography and conditions play a significant role in the weather across the Great Basin, especially during the winter season. In valley locations with widespread snow cover, temperatures will fall rapidly on clear nights. This is because the snow reflects most of the daytime sunlight and radiates any heat that is absorbed very efficiently at night. Nearby mountains also help cool the valleys as higher terrain will cool more quickly in the late afternoon and evening, draining down into the valleys overnight. Wild Horse Reservoir is typically the coldest location in the state, mainly for these reasons. The Wild Horse valley is above 6000 ft in elevation, surrounded on three sides by mountains and receives copious amounts of snowfall during the winter season. Low temperatures at Wild Horse fell to the mid 30's below zero in late January of this year.

Wild Horse on a sunny day with above average snowfall on the ground.

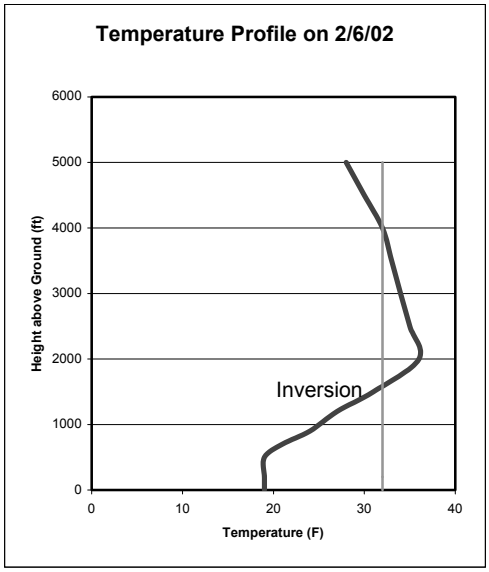
Another effect the mountains have on our weather in the cold season is to keep cold air in the deeper valleys. Cold air is characteristically dense and can sometimes be hard to get rid of when it becomes entrenched in the valleys of northeastern Nevada. Snow cover in the valleys will also reflect sunlight in the daytime, keeping the valleys cooler. When cold air is trapped in the valleys, temperatures actually become warmer with height. Meteorologists call this an inversion. (*See page 7 for more detailed information on inversions.*) During the first week of February, temperatures warmed to the mid 40's in Winnemucca and Battle Mountain, located in broad valleys where there was little or no snow cover. Elko lies in a narrow portion of the Humboldt river valley where the cold air was easily trapped, and temperatures remained in the 20s. Just 3000 feet above Elko in Lamoille Canyon, temperatures approached 50 degrees.

A picture of the sign for Wild Horse Dam shows snow up to the guard rails along Hwy 225.

The upcoming spring season will bring more interesting weather in which the varied topography of northern Nevada will play an important role. Feel free to check out our web site at www.wrh.noaa.gov/Elko to get the latest current conditions, forecasts and much more.

What Is a Valley Inversion? By Jim Wallmann, Journey Forecaster

Most people are accustomed to the idea of temperature decreasing as you increase elevation. For example, one will hike in the cooler mountains during a hot summer day. However, occasionally temperatures will increase with height. When this happens, the atmospheric layer where temperature increases is called an inversion. Inversions are characterized by extreme stability, and any air moving through them will greatly resist any vertical motion. This fact makes them quite difficult to 'break' at times, especially during winter.



Inversions are actually quite common throughout northeastern and east central Nevada. On clear nights during the summer, they will frequently occur as the surface of the earth cools faster than the atmosphere immediately above it. Thus, nighttime inversions are almost a daily occurrence during the summer. Once the sun rises, it will start heating the earth's surface faster than the air above it, and the inversion will be 'broken'.

In winter, inversions also occur quite frequently, especially at night. However, with the sun not able to provide enough heat to break the inversion during the day, they can last for several days. When there is abundant snow cover, which will reflect most of the sun's energy, the inversion will get even stronger.

Winter 2001-02 has been a very good one for inversions in northern Nevada. For example, on January 8th, the afternoon high in Elko was 38 degrees, but the high at 7800 feet in Lamoille Canyon of the Ruby Mountains was 54 degrees. Another good example illustrates the importance of a snowpack in breaking the inversion during the day. On February 3rd, Elko had significant snow cover and only reached 22 degrees for a high, and Wild Horse Reservoir only reached 17 degrees. In contrast, Winnemucca, which had no snow cover, reached a daytime high of 48 degrees, and Battle Mountain reached 42 degrees. Although these two examples are extreme, they give an idea of how much inversions play a role in determining temperatures from day to day.

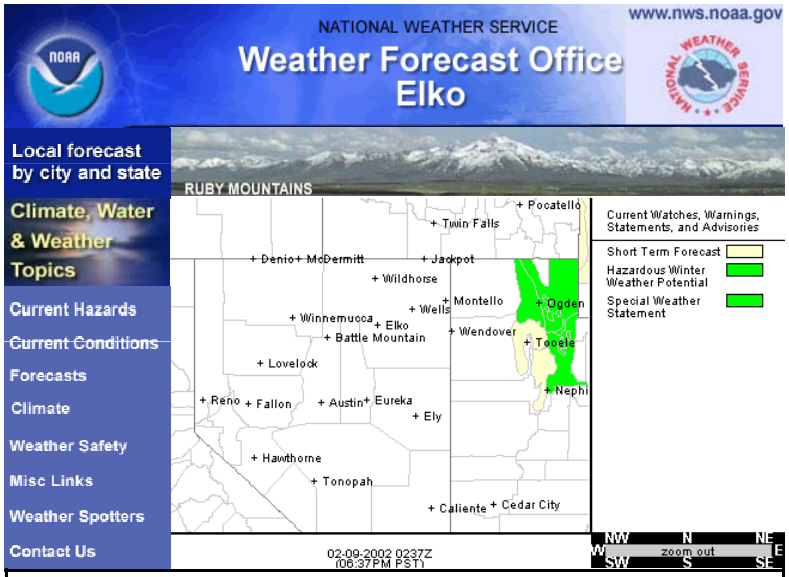
Avalanches (Continued from Page 2)

So what clues should a person look for? When crossing terrain, be aware of any slopes that look like avalanche "chutes." Large vertical swaths of trees missing from a slope or chute-like clearings are often signs that large avalanches run frequently there. Also, there may be a large pile-up of snow and debris at the bottom of the slope as an indication that avalanches have run before.

Several factors that may affect the likelihood of an avalanche are: weather, temperature, slope steepness, whether the slope is facing north or south, wind direction, terrain, vegetation, and snowpack conditions. Combinations of these factors can create low, moderate or extreme avalanche conditions. Some of these conditions, such as temperature and snowpack, can change on a daily or even hourly basis. This necessitates constant awareness of your immediate surroundings while doing any winter backcountry travel. The route you take may be safe when you begin, but may become dangerous if conditions dramatically change. The best way to learn more about avalanche conditions and preparations is to take a course in avalanche survival. Such courses provide information on how to determine the stability of the snow, what signals to look for on the terrain and snowpack you are traveling, what to do if caught in an avalanche, and what equipment to bring in order to facilitate search and rescue efforts.

(Portions of this article were taken from the website for the National Snow and Ice Data Center (NSIDC), part of the University of Colorado Cooperative Institute for Research in Environmental Sciences, and is affiliated with the National Oceanic and Atmospheric Administration National Geophysical Data Center through a cooperative agreement. For more information check out at: http://nsidc.org/snow/avalanche/index.html#WHEN)

Changes to Elko Webpage by Brian Fehrn, Webmaster



A snapshot of WFO Elko's new homepage which features a new standardized design.

Our Homepage has a new design!

The National Weather Service (NWS) is beginning to implement a new corporate image on the internet. This image, crafted by a cross-cutting design team representing different facets of the NWS, features consistent navigation to our most sought information on the Internet. The image also brings a corporate look and feel to all NWS websites. Our website is already implementing this new design and can be viewed at http://www.wrh.noaa.gov/Elko.

The links have changed on the left side of our homepage, but we have added more pages including expanded links for our aviation aficionados and a new forecast model page. Another new feature with this corporate design is the ability to load numerous graphical images on the Elko NWS homepage. This allows everyone to view radar, satellite, and surface data all on one page by clicking on different links located above the map centered on our homepage. If you have any comments, questions, or suggestions for our website, please call us at (775) 778-6716, or e-mail our webmaster at w-lkn.webmaster@noaa.gov.

Pictured on Left: Brian Olsen of the Student Career Education Program (SCEP) at WFO Elko was a volunteer for the 2002 Winter Olympics in Salt Lake City, Utah. Brian took observations that supplemented forecasts for cross country skiing events.

Articles contributed by NWS Elko staff
Editor: Jennifer Stroozas